

Amalgamated Zinc in the Battery 215

surface of these incidental metals. In the same proportion as they serve to discharge or convey the electricity back to the zinc, do they diminish its power of producing an electric current which shall extend to a greater distance across the acid, and be discharged only through the copper or platina plate which is associated with it for the purpose of forming a voltaic apparatus.

735. All these evils are removed by the employment of an amalgam of zinc in the manner recommended by Mr. Kemp,¹ or the use of the amalgamated zinc plates of Mr. Sturgeon (598), who has himself suggested and objected to their application in galvanic batteries; for he says, "Were it not on account of the brittleness and other inconveniences occasioned by the incorporation of the mercury with the zinc, amalgamation of the zinc surfaces in galvanic batteries would become an important improvement; for the metal would last much longer, and remain bright for a considerable time, even for several successive hours; essential considerations in the employment of this apparatus." ²

736. Zinc so prepared, even though impure, does not sensibly decompose the water of dilute sulphuric acid, but still has such affinity for the oxygen, that the moment a metal which, like copper or platina, has little or no affinity, touches it in the acid, action ensues, and a powerful and abundant electric current is produced. It is probable that the mercury acts by bringing the surface, in consequence of its fluidity^ into one uniform condition, and preventing those differences in character between one spot and another which are necessary for the formation of the minute voltaic circuits referred to (734). If any difference does exist at the first moment, with regard to the proportion of zinc and mercury, at one spot on the *surface*, as compared with another, that spot having the least mercury is first acted on, and, by solution of the zinc, is soon placed in the same condition as the other parts, and the whole plate rendered superficially uniform. One part cannot, therefore, act as a discharger to another; and hence *all* the chemical power upon the water at its surface is in that equable condition (684), which, though it tends to produce an electric current through

the liquid to
another plate of metal which can act as a
discharger (685),
presents no irregularities by which any one part,
having weaker

¹Jameson's *Edinburgh Journal*, October 1828.

²*Recent Experimental Researches*, p. 42, etc. Mr.
Sturgeon is of course
unaware of the definite production of electricity by
chemical action, and
is in fact quoting the experiment as the strongest
argument *against* the
chemical theory of galvanism.